

has been chiefly attracted to the tales by their literary merits, and has sought with no little success to make these the prominent feature in her renderings. This at times involves the omission of details that are not without interest, but, after all, there is enough left to give a fair impression of what can be learned from the old literature of Ireland. This mass of legend, for the most part taking its final form about the twelfth century, but demonstrably far older in origin, is, in fact, a perfect mine of primitive custom and belief, and as such is full of interest for the anthropologist. Where the ordinary reader will only see something fanciful or unintelligible, the specialist will often discern an interesting survival or a striking parallel, even if it is hard at times to draw the line between Irish tradition and Irish imagination.

The peculiar character of these tales is due to a double tendency in Irish literature. On the one hand there is an exuberant imagination which recklessly transcends all limits of time and space; on the other there is a love of minute detail which constantly brings in the smallest features of everyday life and work. To the latter tendency we owe the minute descriptions of the appearance and dress of the heroes, of their horses and chariots, their arms and modes of fighting, their palaces and forts, and so on. It is a kind of Homeric life and culture that meets us here, yet with a greater admixture of primitive types, civilisation and barbarism being strangely intermingled. Nor does the Homeric Olympus lack its counterpart, for behind the real world of mortal heroes lies the realm of the Sidhe and the Tuatha De Danann, constantly reminiscent of the old Celtic mythology which Christianity has displaced. With a real and an imaginary world to move between, there is nothing that the Irish story teller will not dare to say; nothing is either too mean or too marvellous for him. Man and animal are interchangeable beings. Cuchulain himself is a reincarnation of Lugh (one of the old gods), who takes the shape of an insect and is swallowed by the sister of Conchubar. Curóí makes his fort whirl round like a millstone all night, so that no one can enter it after sunset. The bridge in Scotland which Cuchulain has to cross can alter its own shape and size at pleasure. Conchubar's shield moans when he is in danger, "and all the shields of Ulster would moan in answer to it." Wells and streams have a faculty of bursting out and overflowing whole tracts of country, and it is out of two lakes that Cuchulain gets his famous pair of horses, the Grey and the Black. Charms and spells are as potent as in Africa, and satire may be so deadly as to kill its victim. Fingian the physician "could tell what a person's sickness was by looking at the smoke of the house he was in." It is three champions of the Sidhe who have to be killed three times before they are done with; but even mortal heroes have an almost feline tenacity of life. It is well for them that this is so, for their chief happiness consists in fighting; in cases of single combat the chariot-driver usually looks on and encourages his master, or goads him on to do his best by means of bitter taunts. Feats of strength and skill are naturally common, but some of those mentioned are not easy to understand. Still stranger are the distortions of Cuchulain when in a rage, for which Lady Gregory has substituted the very euphemistic statement that he assumed the appearance of a god;

the direct opposite would not overstate the case. Contention and jealousy are rampant among the heroes, and each unblushingly sounds his own praises and states his claims to the "Champion's Portion," which after all is only a certain quantity of food and drink. Yet the spirit of chivalry is not wanting, and an adventurous quest is greatly to their minds. But while they are ready to face most dangers without shrinking, the power of *geasa* or taboo lies heavy on them. Before Conaire meets his death, he has succeeded in doing everything which he ought not to have done. Historically these *geasa* are known from the "Book of Rights," and form a curious study. Of great interest, too, is the periodic weakness of the men of Ulster, which has been the subject of much discussion among scholars.

As to the central figures in the cycle, Conchubar and Cuchulain, many difficult problems present themselves. It is possible that they take the place of older mythological personages, especially as Conchubar is actually called a god in one text and Cuchulain is the representative of Lugh. Those who are interested in this feature of early Irish literature may be referred to Prof. Rhys's Hibbert lectures, where the solar explanation of Celtic myths receives full consideration, and to Mr. Nutt's study of the "Celtic Doctrine of Rebirth" in "The Voyage of Bran." It is precisely because these Irish tales can provide materials for serious works of this kind that their perusal will be found, not only interesting, but profitable; and this new version of the Cuchulain cycle may do good service in spreading a knowledge of Celtic legend outside the small circle of scholars who have made it a subject of special study.

OUR BOOK SHELF.

Flora Arctica. Part i. By C. H. Ostenfeld. Pp. xi + 136. (Copenhagen: Det Nordiske Forlag, 1902.)

THE records of plants collected in the Arctic regions are for the most part scattered through numerous papers and written in various languages. At the request of Prof. Warming, Mr. O. Gelert in 1898 undertook to work up, revise and combine the accumulated data, basing his investigations on the collections belonging to the Copenhagen Museum. The work promised to be so extensive that he requested Mr. C. H. Ostenfeld to cooperate with him. This cooperation was cut short in 1899 by Mr. Gelert's premature death, and since that time Mr. Ostenfeld has continued the work alone. The limits of the Arctic territory as here interpreted coincide fairly nearly with the limits of the wood-boundary. This has its anomalies, for, as shown by the map provided, all Greenland is included almost to the 60th parallel, while Iceland in longitude 65° N. and Norway which extends higher than the 70th parallel are excluded. This the first volume contains the Pteridophyta, Gymnospermæ and Monocotyledons. The Pteridophytes are very few in number, the large group of Filices being limited to ten species. The Gymnosperms included are but three, this being the result of the boundary adopted. Amongst the Monocotyledons the most extensive orders are the Gramineæ, with twenty-four genera and sixty-one species, and the Cyperaceæ, including six genera, of which *Carex*, the most important, is subdivided into fifty-four species. In dealing with this genus the author has had the benefit of Mr. C. B. Clarke's valuable assistance. The Gramineæ were undertaken by Mr. Gelert, and the arrangement given is that left by him. The larger proportion of the illustrations refer to the Carices;

the figures of the general appearance are good, but the sketches of details, as, for instance, the utricles, are too small to help much in determination of species. They would be more satisfactory if they were drawn natural size or larger. The book is written in English.

An Arithmetic for Schools. By J. P. Kirkman, M.A., and A. E. Field, M.A. Pp. lxi + 492. (London: Edward Arnold, n.d.) Price 3s. 6d.

THE distinguishing characteristics of this book are simplicity and great clearness of exposition. The first two chapters deal mainly with our terrible English system of weights and measures, and in this lawless region no skill on the part of an author can be of service to the beginner. Once this tangled wilderness is passed, however, the skill of the authors in exposition comes into play. The treatment of common measures and multiples and the various rules for ascertaining rapidly whether a given number is or is not divisible by specified numbers are very clearly and successfully explained. The philosophy of the rules for the division and multiplication of vulgar fractions is very plainly set forth, and the rules for the contracted multiplication and division of decimals are well explained and illustrated near the end of the book. We have also an account of the metric system, followed by numerous examples of "practice." After this we have the calculation of areas and volumes, and an adequate exposition of the method of extracting square and cube roots. This is followed by the treatment of interest, stocks, and the various branches of the subject which are found in all arithmetical treatises, and then comes an enormous collection of examples. An appendix explaining and illustrating the use of squared paper for the comparison of scales and other kinds of calculation forms a useful and interesting conclusion.

The work is one which can be very confidently recommended to all teachers and students of arithmetic.

A First Step in Arithmetic. By J. G. Bradshaw, B.A. Pp. vi + 166. (London: Macmillan and Co., Ltd., 1902.) Price 2s.

ONLY the first four rules, simple and compound, are covered by this book, but the exercises upon them have been so carefully selected and arranged that children who receive instruction through them will acquire an intelligent and working knowledge of simple arithmetic. The exercises are arranged for both oral and paper work, and there is no doubt that the combination of the two methods of teaching the subject gives the best educational result. In most text-books of arithmetic, the pupils are discouraged at the outset by exercises and problems beyond their comprehension, but Mr. Bradshaw deals with amounts which beginners will have no difficulty in grasping and will work out successfully. An essay containing hints on methods of presenting the early rules of arithmetic, which occupies the first twenty-nine pages, contains some notes of service to inexperienced teachers of children; but they are out of place in a pupil's book, and belong rather to a volume on the practice of teaching.

The Real Origin of Religion. By Jabelon. Pp. 48. (London: Simpkin, Marshall and Co., Ltd., 1902.)

THE object of this pamphlet is to establish the not very novel or fortunate hypothesis of the phallic origin of all religious symbolism. The proofs offered are of three kinds, none of which possesses any real cogency. Certain savage tribes attach great importance to circumcision and other mutilations of the sexual organs, the reason for which is unknown. Therefore, the author argues, all primitive ceremonialism must be of sexual significance. This conclusion is supported by a number of etymologies, all unscientific and demonstrably false, and by an obscurely worded attempt to interpret the vision of Ezekiel as an account of the anatomical structure of the brain. The scientific value of the farrago is precisely nil.

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LETTERS TO THE EDITOR.

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Re Vegetable Electricity.

I AM reluctantly obliged to traverse a statement made by Prof. J. C. Bose (in the *Journal* of the Linnean Society of July 21, p. 304, footnote) to the effect that "Dr. Waller has subsequently been able to confirm the results which he (Dr. W.) heard me describe on the occasions referred to (Royal Institution, May 10, 1901; Royal Society, June 6, 1901).

I am compelled to state that Prof. Bose, previously to these dates, visited my laboratory on several occasions, received every facility that I was able to afford him as regards the methods by which I was and am investigating the physiological properties of animal and vegetable protoplasm, and *inter alia* heard from me, and has doubtless forgotten, the statement that the electrical response of plants is a general property of vegetable protoplasm, and not confined to such plants (*dionea*, *mimosa*, &c.) as exhibit obvious movements.

Prof. Bose obtained (with my full approval) from my laboratory-mechanic the principal instruments used by me in such investigations, has imitated some of my experiments, and has gradually adopted their guiding theory. He is not entitled to make the statement quoted above.

AUGUSTUS D. WALLER.

P.S.—In connection with this subject of vegetable electricity I may take this opportunity of commenting upon two series of observations that have been made in Germany in contradiction of some of my principal conclusions.

Prof. Adami, of Hof, quotes from the German translation of 1899 of my "Lectures on Animal Electricity," published in 1898, the following passage:—"Verbindet man zwei Punkte A und B der unverletzten Kartoffel mit dem Galvanometer, so lässt sich kein merklicher Strom nachweisen; sobald aber die Kartoffel an einem Punkte B durch einen Messerschnitt verletzt wird, schlägt der Lichtfleck nach rechts aus, infolge der chemischen Thätigkeit und elektromotorischen Kraft, die durch den Schnitt erregt worden sind. Man beachte, dass dieser Versuch, im strengsten Sinne des Wortes, eine Vivisektion ist. Für unseren Zweck muss die Kartoffel lebendig sein. Die Wirkung bleibt vollständig aus, wenn die Kartoffel durch kochen getötet worden ist."¹

He then proceeds to give an account of a considerable number of experiments contradictory of the above statement. Prof. Adami, of Hof, did not use unpolarisable electrodes, but copper pins. It is not surprising that he should have failed to observe any signs of vegetable electricity.

Dr. Arthur Tompa, working in the Botanical and Physiological Institutes of the University of Halle, under the direction of Prof. Bernstein and Prof. Klebs, and with the advantage of the knowledge and experience of Dr. Tschermak, quotes on p. 100² the ten headings of my communication at the Turin Congress on Vegetable Electricity, and quite correctly selects for reinvestigation as being the general and most important topic, paragraph 5, "The Electrical Response as a Measure of 'Vitality.'" He devotes much time and care to this reinvestigation, and somewhat reluctantly comes to the conclusion that Waller's blaze reaction is a fallacy arising from the fact that Waller has followed erroneously the direction of current. He devotes a diagram and a page of description, p. 104,³ to his hypothesis in explanation of this imaginary blunder. I do not think that I have mistaken the direction of current, or that Dr. Tompa could have supposed that I was liable to do this if he had been at the pains to look at any of the diagrams in any of the papers of mine that he quotes.

Dr. Tompa should also have noticed in any of these papers that I have always spoken of excitation by induction currents and by condenser discharges. He has used the direct current of one or more Daniell cells. I have never done this for the reason that such currents give predominant polarisation counter-currents on living and on dead tissues alike. The blaze

¹ Sonderabdruck aus dem ii. Bericht des nordoberfränkischen Vereins für Natur-Geschichts- und Landeskunde.

² A. Tompa, *Beiträge zur Pflanzlichen Elektrizität* ("Botanisch. Beiheften," original arbeiten).

³ *Ibid.*